SOUTH FLORIDA WATER MANAGEMENT DISTRICT

Implementation of Flow Data Accuracy Improvement

Data Change Procedures

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sfwmd.gov

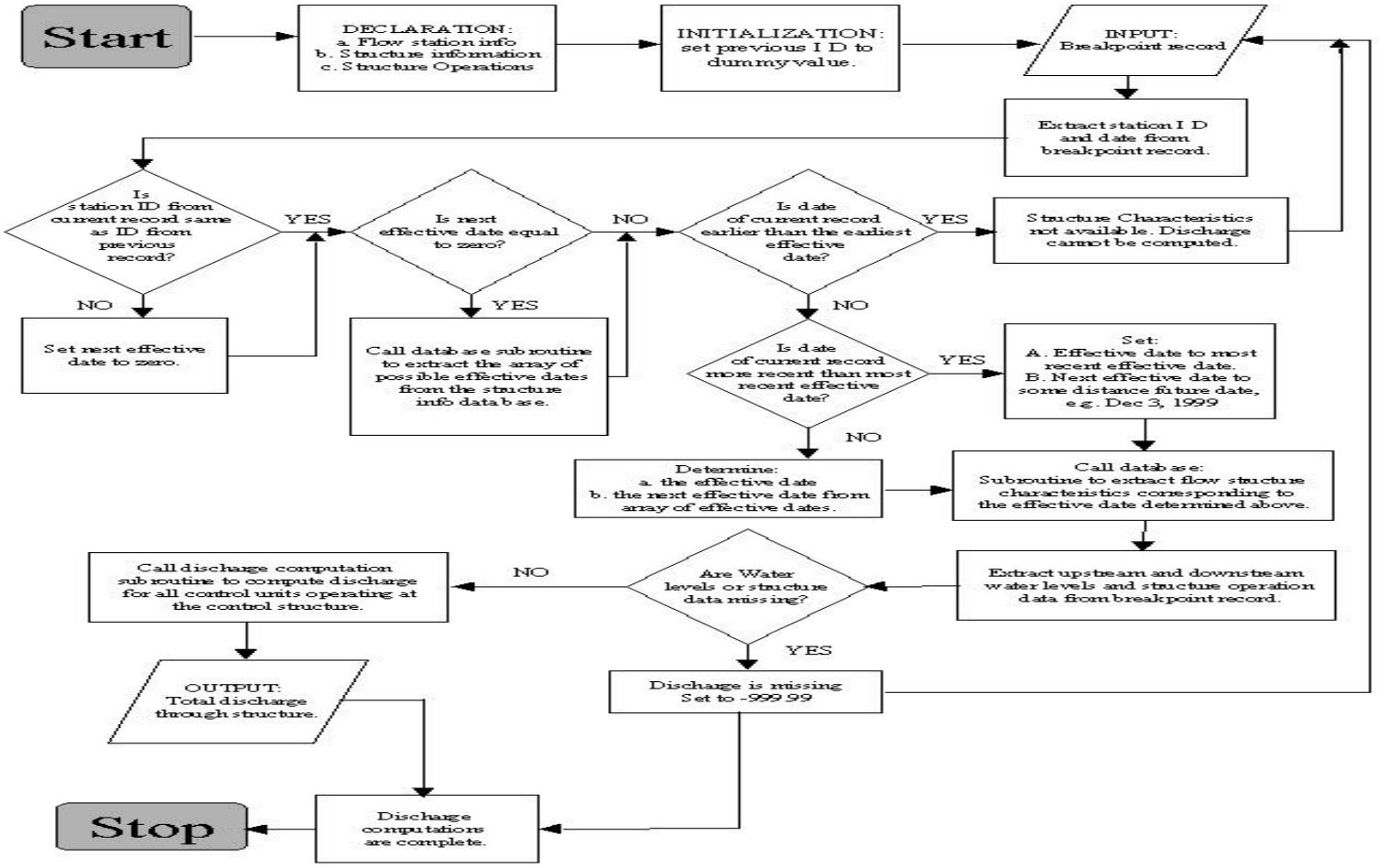
Main Topics

- Flow Data Production
- Evolving Flow Data quality Needs
- Flow Data Change Triggers
- Flow Data Change Criteria
- Flow Data Change Implementation
- Summary

Flow Data Production

- Flow is water quantity going through a control section
- Over 400 major control structures
- Control structures: spillways, culverts, pumps (equations)
- Quantity estimated using FLOW Program

Flow Data Production



Evolving Flow Data Quality Needs

- Clean Water Act 1972
- Everglades Forever Act 1994
- Emphasis on water quality monitoring
- Contaminant load computation
- More stringent flow data accuracy requirements

Flow Data Change Triggers

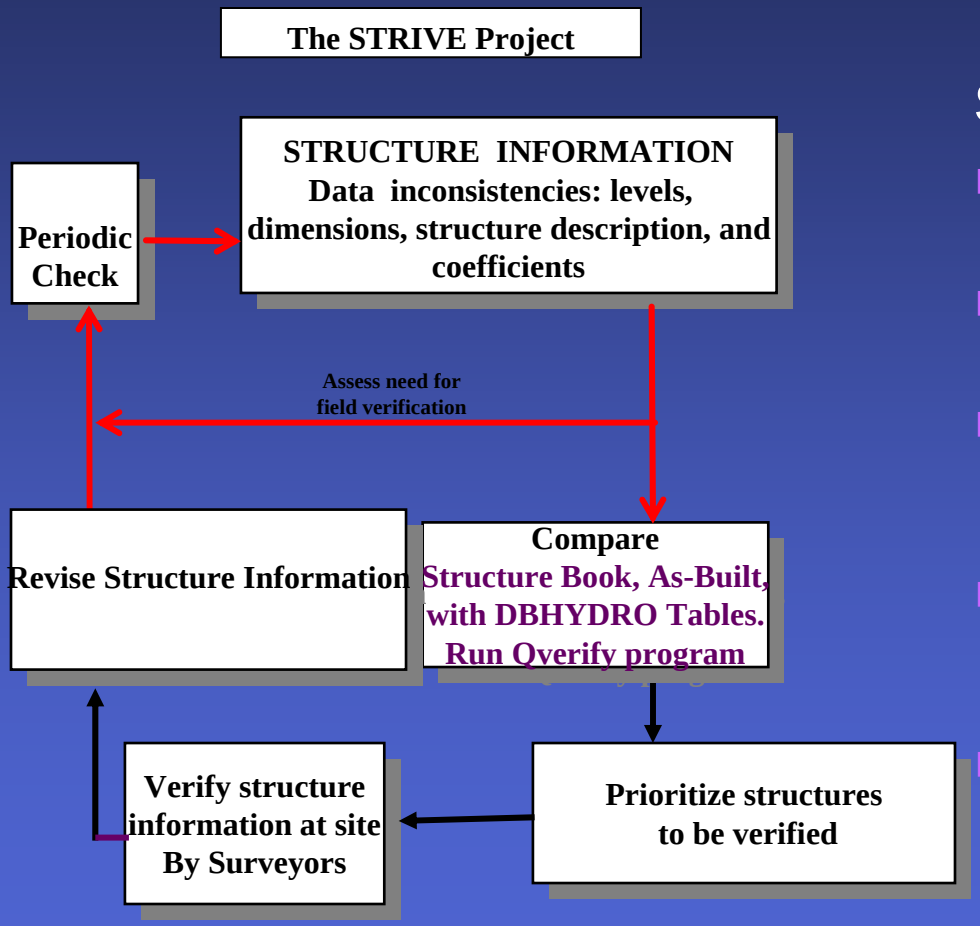
- Datum adjustments
- Structure reconfiguration
- Improved data acquisition & processing
- Flow rating improvement
- Software enhancements

Flow Data Change Triggers

Datum Adjustments

- Reference elevation Changes likely to affect flow estimates
- Re-evaluation of flow data required following datum adjustment

Flow Data Change Triggers



Structure Reconfiguration

- Structures Physical Characteristics Change
- Replacement or modification of structures
- Reporting of modifications not communicated to HHD in Time
- Change in structure configuration affect FLOW output
- STRucture Information VErification (STRIVE Project) Since 1998

Flow Data Change Triggers

Improved data acquisition tools

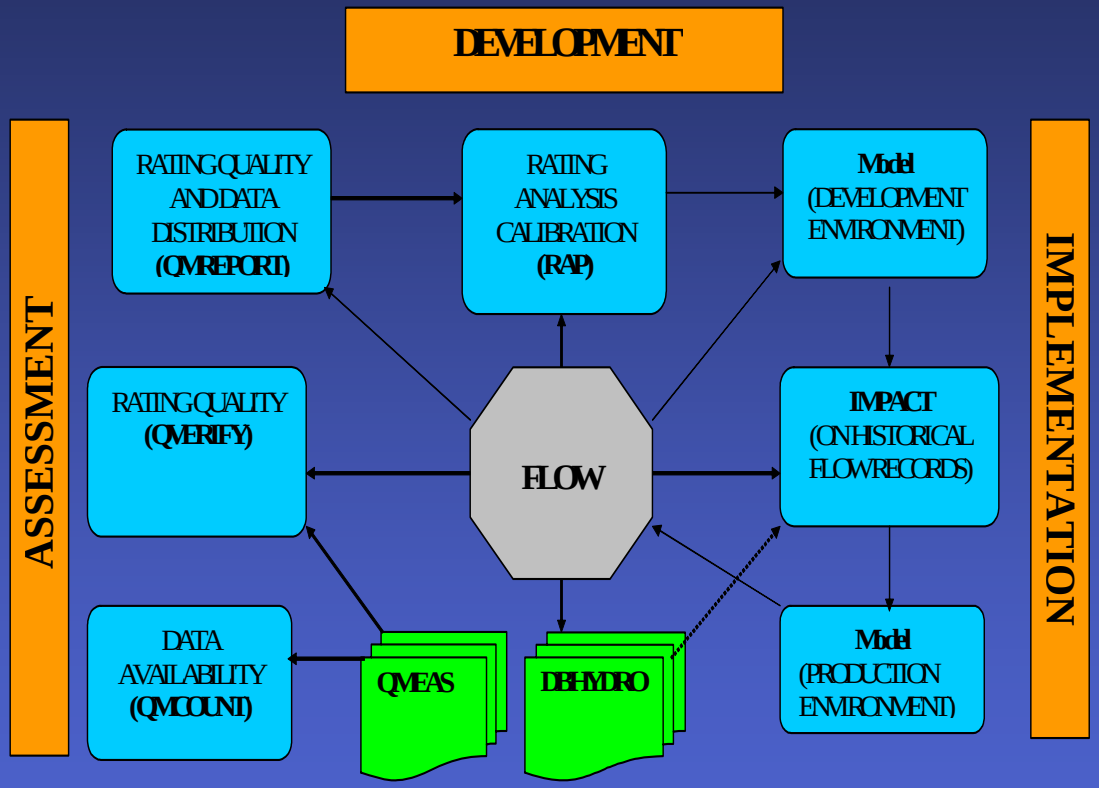
- Streamgauging output improved since 1990s (ADCP)
- <100 measurements per year before 1990
- >500 measurements per year after 1990
- Contractual services increased capacity

Flow Data Change Triggers

Flow Rating Improvement

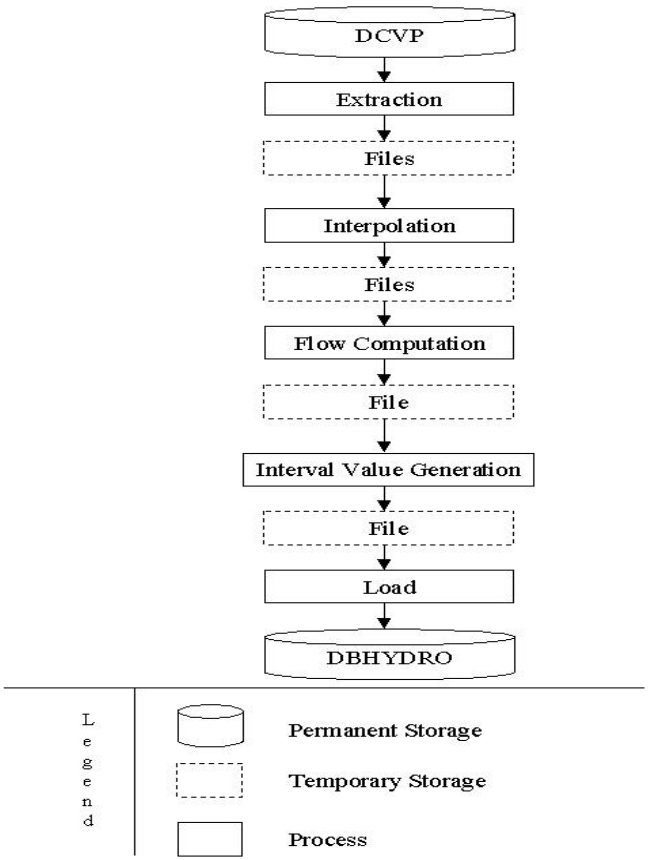
- Original flow ratings based on scale models of 1963 (by USACE)
- Others developed with few streamflow measurements
- Some were based on theoretical/empirical equations

Flow Data Change Triggers



- Rating Improvement
- Processes
- Main model (FLOW)
- Related applications
- Databases

Flow Data Change Triggers



Enhancement of Flow-Related Applications

- Flow computation process involves many software Applications:
- FLOW, EXTRACT Routine, Interp_bkpt, IVG Dbhydro_Loader
- These Applications Undergo Continuous Revisions
- Changes in these applications may affect the Flow estimates

Flow Data Change Triggers

Qualification of Flow Rating Equations

- For 95-percent confidence level a rating is qualified as:
- Excellent when errors are within ±5 %.
- Good when errors are within ±10%
- Fair when errors are within ±15 %
- Poor When errors are not within ±15 %

Flow Data Change Triggers

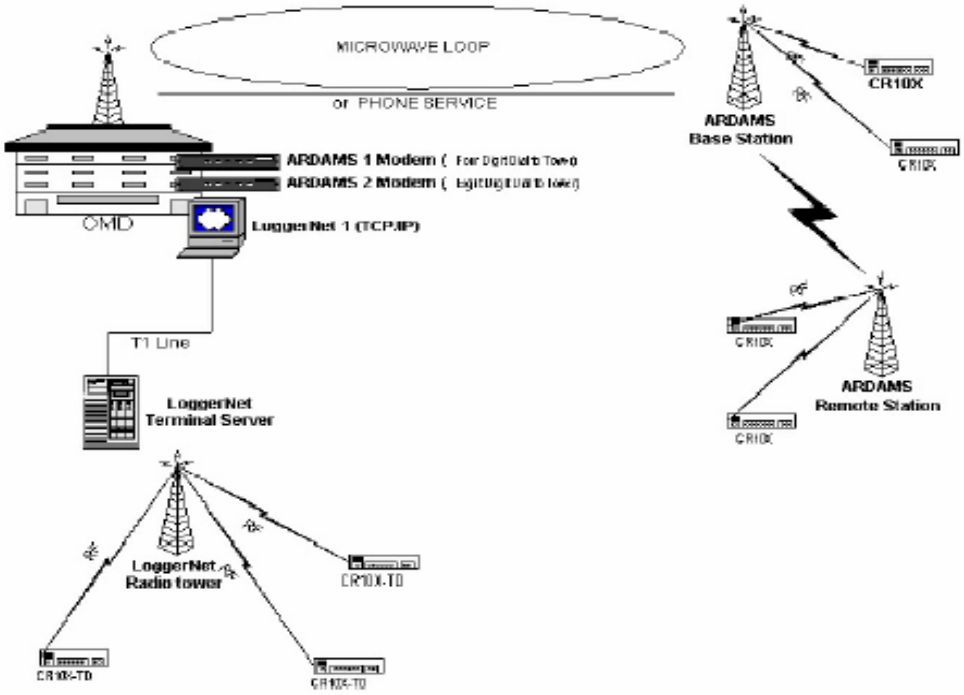


Figure 2: SFWMD Data Collection Network Infrastructure

Data Processing Corrections

- Errors from data recording media
- Graphic recorders and manual operation logs more prone to errors
- Date/Time errors most common
- Electronic and telemetric recording devices malfunction and cause spikes
- Unresolved anomalies may lead to data change in DBHYDRO later

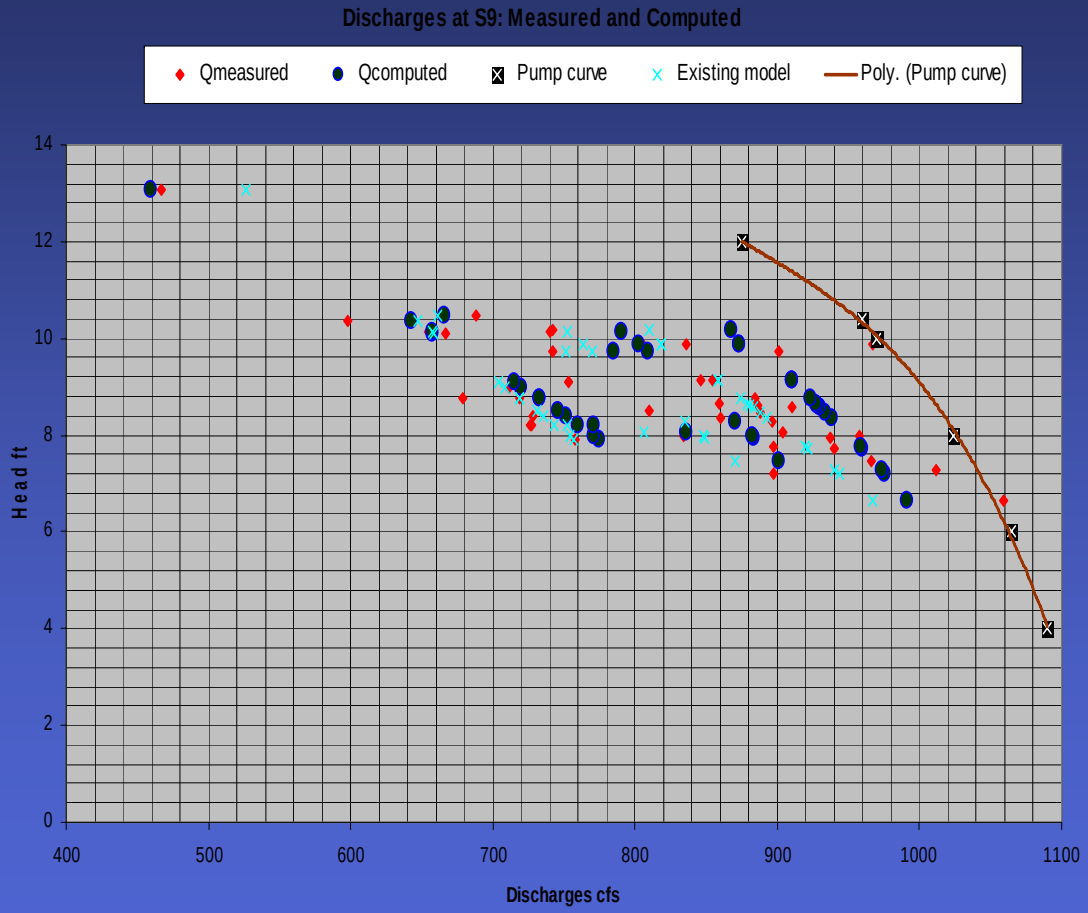
Flow Data Change Criteria

- No data change if change in Q < 5%
- Data change if change in Q>10%

For a period of record considered

- No data change if the change in Volume < 5%

Flow Data Change Criteria



- If change in volume is between 5% and 10 %, change is considered with other factors
- If change in volume V > 10%, change is recommended

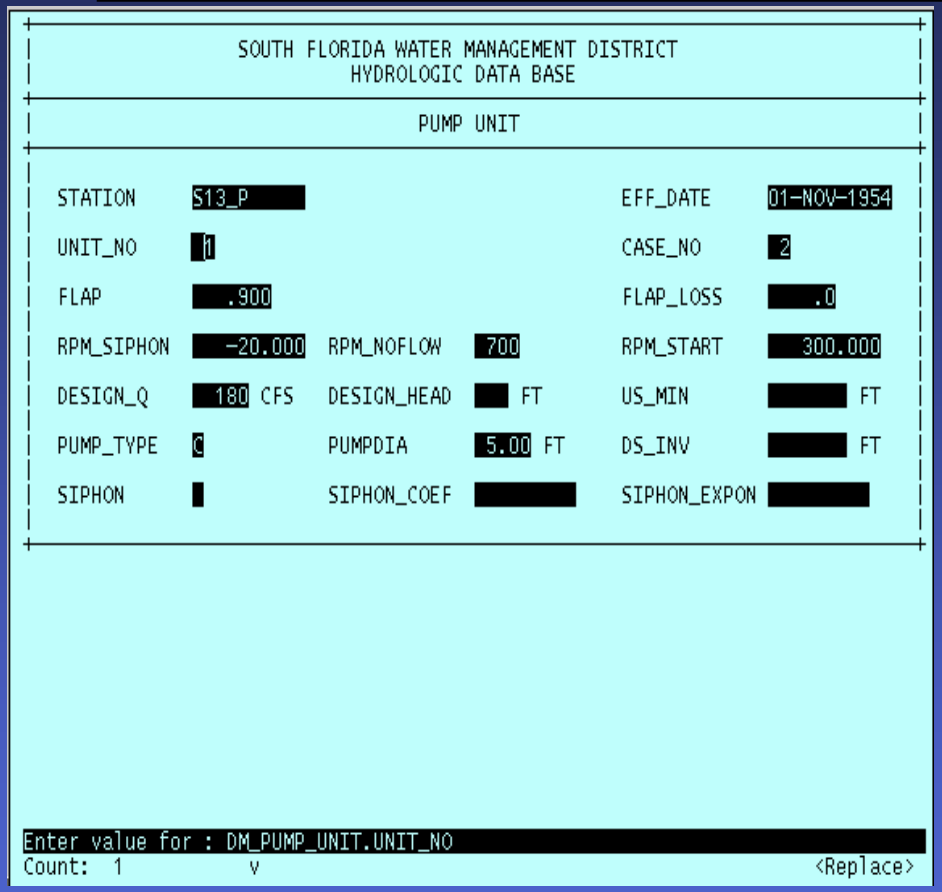
Flow Data Change Implementation

- Intent to change communicated to interested parties
- Provide review period and solicit comments
- Interested parties comment on proposed data change

Flow Data Change Implementation

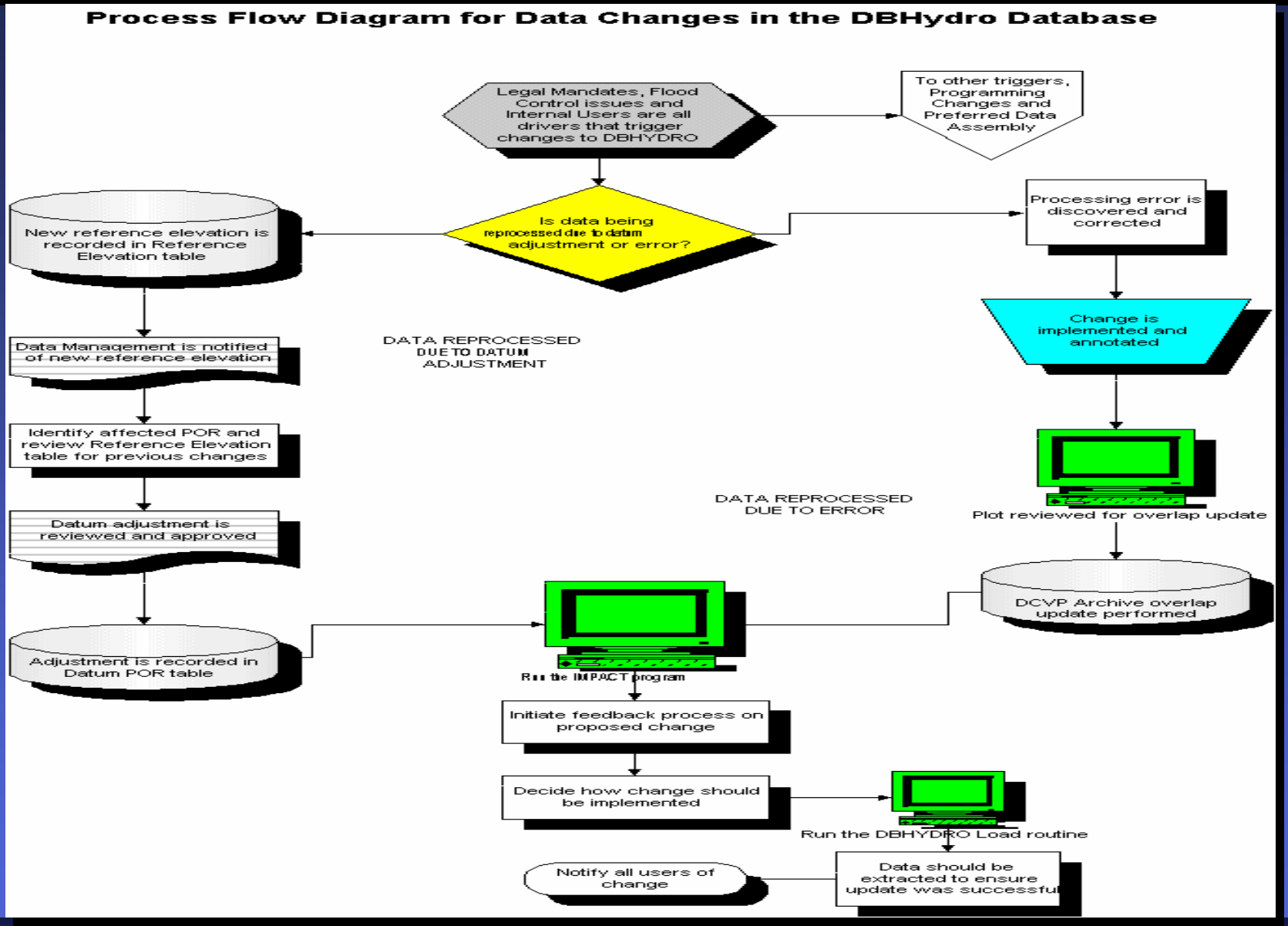
- Address all major concerns/issues before implementing the Change
- Data change in DBHYDRO upon expiration of review period and approval of HH Director

Flow Data Change Implementation



- All changes in DBHYDRO documented
- Information: What, Who, When and Why, stored in DBHYDRO

Process Flow Diagram for Data Changes in the DBHydro Database



Summary

- Flow data accuracy requirements are changing following policy and law
- Flow data accuracy improves with advances in technology and knowledge
- Flow data changes occur for accuracy improvement and correction of errors
- Some aspects of data changes are captured in Dbhydro

Any ?s